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Education

Ph.D., School of Automation, Beijing Institute of Technology, Beijing, 2012.9-2019.1. Adviser: Chen Chen and Bin Xin.

Visiting Scholar (Joint Ph.D. Student), Center for Applied Optimization, Industrial and Systems Engineering, University of Florida, Gainesville, FL, 2016.9-2017.9. Adviser: Panos M. Pardalos.

B.Eng. in Electronic and Information Engineering, Exchange Student, The Hong Kong Polytechnic University, Hong Kong, 2011.1-2011.6.

B.Eng. in Automation, Beijing Institute of Technology, Beijing, 2008.9-2012.6.

Employment

Associate Researcher, Signal and Communication Research Institute, China Academy of Railway Sciences Corporation Limited, 2021.9-present.

Assistant Researcher, Signal and Communication Research Institute, China Academy of Railway Sciences Corporation Limited, 2019.7-2021.9.

Research Interests

Railway Scheduling, Evolutionary Computation, Optimization under Uncertainty, Multi-objective Optimization.

Publications

Papers under review/revision

1. S. Ding, T. Zhang, R. Wang, Y. Sun, X. Zhou, Chen Chen, Z. Yuan*. "An Improved Genetic Algorithm for Train Platforming Rescheduling under Train Arrival Delays". *Journal of Advanced Computational Intelligence and Intelligent Informatics*, 2023, submitted.

2. L. Jiao, Z. Peng*, M. Guo, S. Ding, J. Cui. "Location-routing problem with interdependent mobile depots for post-disaster relief". *Expert Systems with Applications*, 2023, submitted.

3. Y. Wei, X. Zeng, H. Fang*, Y. Ding, S. Ding. "Generalized Nash equilibrium seeking for directed nonsmooth multi-cluster games via a Distributed Lipschitz algorithm". *IEEE Transactions on Control of Network Systems*, 2023, submitted.

4. R. Wang, Q. Zhang*, X. Dai, Z. Yuan, T. Zhang, S. Ding, Y. Jin. "An efficient evolutionary algorithm for high-speed train rescheduling under a partial station blockage". *Applied Soft Computing*, 2022, revise.

5. S. Ding, T. Zhang*, C. Chen*, Y. Lv, B. Xin, Z. Yuan, R. Wang, P. M. Pardalos. "An efficient particle swarm optimization with evolutionary multitasking for stochastic area coverage of heterogeneous sensors". *Information Sciences*, 2022, revise.

Book

1. S. Ding, C. Chen, Q. Zhang, B. Xin, P. M. Pardalos. *Metaheuristics for Resource Deployment under Uncertainty in Complex Systems*. Boca Raton FL, USA: CRC Press, 2021.

Journal Articles

1. S. Peng, X. Yang*, S. Ding, J. Wu, H. Sun. "A dynamic rescheduling and speed management approach for high-speed trains with uncertain time-delay". *Information Sciences*, 2023, 632, 201-220.

2. J. Cai, Z. Peng*, S. Ding, Z. Wang, Y. Wei. "A problem-specific parallel pareto local search for the reactive decision support of a special RCPSP extension". *Complex & Intelligent Systems*, 2023, accepted.

3. J. Wu, C. Pu*, S. Ding, G. Cao, C. Xia, P. M. Pardalos. "Multi-objective optimization of transport processes on complex networks". *IEEE Transactions on Network Science and Engineering*, 2023, 10(2): 780-794.

4. L. Jiao, Z. Peng*, L. Xi, M. Guo, S. Ding, Y. Wei. "A multi-stage heuristic algorithm based on task grouping for vehicle routing problem with energy constraint in disasters". *Expert Systems with Applications*, 2023, 212, 118740.

5. R. Wang, Q. Zhang*, T. Zhang, T. Wang, S. Ding. "Intelligent Adjustment Approach for Train Operation Based on Monte Carlo Tree Search-Reinforcement Learning". *Zhongguo Tiedao Kexue/China Railway Science*, 2022, 43(5): 146-156.

6. Y. Sun, T. Zhang, T. Wang, S. Ding*, K. Sheng, Z. Li. "Reliability Evaluation of High Speed Railway Traffic Control System Based on Cloud Model and Combined Weighting Method". *Tiedao Yunshu Yu Jingji/Railway Transport and Economy*, 2022, 44(8): 103-109.

7. R. Wang, Q. Zhang*, L. Yan, S. Ding. "Online Deduction of Train Operation Situation under Regional Temporary Speed Restriction". *Tiedao Yunshu Yu Jingji/Railway Transport and Economy*, 2022, 44(7): 127-132.

8. J. Cai, Z. Peng*, S. Liao, S. Ding. "A multi-mode multi-skill project scheduling reformulation for reconnaissance mission planning". *SCIENCE CHINA Information Sciences*, 2022, 65(6): 169201.

9. L. Yan, Q. Zhang*, S. Ding, R. Wang. "High-Speed Railway Train Operation Adjustment Based on Bi-Objective Optimization". *Zhongguo Tiedao Kexue/China Railway Science*, 2022, 43(2): 161-171.

10. S. Ding, T. Zhang*, Z. Liu, R. Wang, S. Lu, B. Xin, Z. Yuan. "A Memetic Algorithm for High-Speed Railway Train Timetable Rescheduling". *Journal of Advanced Computational Intelligence and Intelligent Informatics*, 2022, 26(3): 407-417.

11. S. Ding, T. Zhang, R. Wang, Z. Yuan. "Research on Rescheduling of Arrival and Departure Tracks at High-speed Railway Passenger Station". *Tiedao Tongxin Xinhao/Railway Signalling & Communication*, 2022, 58(8): 32-36.

12. R. Wang, Q. Zhang*, T. Zhang, P. Lin, S. Ding, Z. Yuan. "Real-time rescheduling approach of train operation for high-speed railways using problem-specific knowledge under a station blockage". *SCIENTIA SINICA Informationis*, 2022, 52(11): 2121-2140.

13. L. Jiao, Z. Peng*, L. Xi, S. Ding, J. Cui. "Multi-agent coverage path planning via proximity interaction and cooperation". *IEEE Sensor Journal*, 2022, 22(6): 6196-6207.

14. C. Chen, X. Wu*, J. Chen, P. M. Pardalos*, S. Ding. "Dynamic grouping of heterogeneous agents for exploration and strike missions". *Frontiers of Information Technology & Electronic Engineering*, 2022, 23(1): 86-100.

15. L. Yan, Q. Zhang*, R. Wang, S. Ding. "Train Operation Analysis Based on Dynamics". *Tiedao Yunshu Yu Jingji/Railway Transport and Economy*, 2021, 43(8): 64-70.

16. Y. Ren, Q. Zhang*, Z. Yuan, T. Wang, S. Ding, Z. Li. "Optimization of train platform utilization at high-speed railway stations based on arrival and departure distribution of trains". *Harbin Gongye Daxue Xuebao/Journal of Harbin Institute of Technology*, 2021, 53(8): 137-143.

17. X. Wu, C. Chen*, S. Ding. "A modified MOEA/D algorithm for solving bi-objective multi-stage weapon-target assignment problem". *IEEE Access*, 2021, 9: 71832-71848.

18. J. Cai, Z. Peng*, S. Ding, J. Sun. "Problem-specific multi-objective invasive weed optimization algorithm for reconnaissance mission scheduling problem". *Computers & Industrial Engineering*, 2021, 157, 107345.

19. L. Yan, T. Zhang, Y. Gao, R. Wang, S. Ding*. "Reliability analysis of station autonomous computer system based on fuzzy dynamic fault tree and Markov model". *Engineering Reports*, 2021, 3(8), e12376.

20. Y. Sun, Q. Zhang*, Z. Yuan, Y. Gao, S. Ding. "Quantitative analysis of human error probability in high-speed railway dispatching tasks". *IEEE Access*, 2020, 8: 56253-56266.

21. W. Xu, C. Chen*, S. Ding, P. M. Pardalos. "A bi-objective dynamic collaborative task assignment under uncertainty using modified MOEA/D with heuristic initialization". *Expert Systems with Applications*, 2020, 140, 112844.

22. Q. Zhang, Z. Yuan*, L. Yan, T. Zhang, Y. Miao, S. Ding. "A Railway Train Number Tracking Method Using a Prediction Approach". *IEEE Access*, 2019, 7: 138288-138298.

23. S. Ding, C. Chen*, B. Xin, P. M. Pardalos. "A bi-objective load balancing model in a distributed simulation system using NSGA-II and MOPSO approaches". *Applied Soft Computing*, 2018, 63: 249-267.

24. S. Ding, C. Chen*, B. Xin, J. Chen, "Status and progress in deployment optimization of firepower units". *Kongzhi Lilun Yu Yingyong/Control Theory and Applications*, 2015, 32(12): 1569-1581.

25. S. Ding, C. Chen*, J. Chen, B. Xin, "An Improved Particle Swarm Optimization Deployment for Wireless Sensor Networks". *Journal of Advanced Computational Intelligence and Intelligent Informatics*, 2014, 18(2): 107-112.

Proceedings

1. Y. Sun, S. Ding, K. Sheng, Y. Ren. "Research on Operation Risk Assessment of High-Speed Railway Intelligent Dispatching Centralized Traffic Control System". *ITSAC 2022*, Chengdu, China. 2022.

2. S. Ding, T. Zhang*, R. Wang, Y. Sun, X. Zhou, Chen Chen*. "A Mixed Encoding Genetic Algorithm for Train Platforming Rescheduling under Train Delays". *The 10th International Symposium on Computational Intelligence and Industrial Applications (ISCIIA2022)*, Beijing, China. 2022: 1-6.

3. Y. Sun, S. Ding, Z. Li, Y. Ren, K. Sheng, Y. Yang. "Research on Human Reliability of the High-speed Railway Intelligent Dispatching Centralized Traffic Control System", *2022 7th International Conference on Intelligent Transportation Engineering (ICITE)*, Beijing, China. IEEE, 2022, accepted.

4. G. Gao, B. Xin*, Y. Mei, S. Lu, S. Ding. "A Multi-objective Evolutionary Algorithm with New Reproduction and Decomposition Mechanisms for the Multi-Point Dynamic Aggregation Problem". *In Proceedings of the 2022 Genetic and Evolutionary Computation Conference*, Boston, USA. ACM, 2022: 1182-1190.

5. S. Ding*, T. Zhang, R. Wang, C. Zhang, S. Lu, B. Xin*. "A Comparative Study on Evolutionary Algorithms for High-Speed Railway Train Timetable Rescheduling Problem". *The 7th International Workshop on Advanced Computational Intelligence and Intelligent Informatics (IWACIII2021)*, Beijing, China. 2021: 1-6.

6. S. Ding, R. Wang, X. Zhou, Y. Ren, K. Huang*. "High-Speed Railway Train Timetable Rescheduling in Case of a Stochastic Section Blockage". *2021 Chinese Automation Congress (CAC)*, Beijing, China. 2021: 4322-4327.

7. S. Ding, Q. Zhang*, Z. Yuan. "An under-approximattion for the robust uncertain two-level cooperative set covering problem". *2020 59th IEEE Conference on Decision and Control (CDC)*, Jeju Island, Republic of Korea. IEEE, 2020: 1152-1157.

8. J. Cai, Z. Peng*, S. Ding, J. Sun. "A Robust Genetic Algorithm to Solve Multi-Skill Resource Constrained Project Scheduling Problem with Transfer Time and Uncertainty Skills". *2020 IEEE 16th International Conference on Control & Automation (ICCA)*, Sapporo, Hokkaido, Japan. IEEE, 2020: 1584-1589.

9. Y. Wei, S. Ding, H. Fang*, X. Zeng, Q. Yang, B. Xin. "Distributed Nonsmooth Robust Resource Allocation with Cardinality Constrained Uncertainty". *2019 Chinese Control Conference (CCC)*, Guangzhou, China. IEEE, 2019: 5758-5763.

10. X. Sun*, S. Ding. "Bunker hedging with expected loss control by buffered probability of exceedance and conditional value-at-risk". *In Annual Conference of the International Association of Maritime Economists (IAME)*, Kyoto, Japan. 2017.

11. Z. Sun*, S. Ding. "Research on Standardized Development Method of Scenario for Combat Information Simulation System". *In Proceedings of 33rd Chinese Control Conference (CCC)*, Nanjing, China. IEEE, 2014: 6298-6303.

12. S. Ding, J. Chen, C. Chen*, B. Xin. "An improved deployment algorithm for wireless sensor networks based on Particle Swarm Optimization". *In Proceedings of the Ninth China-Japan International Workshop on Internet Technology and Control Applications*, Beijing, China. 2013: 138-142.

Reviewer for Journals

Advanced Control for Applications

Annals of Mathematics and Artificial Intelligence

Applied Soft Computing

Complexity

IEEE Access

IEEE Transactions on Circuits and Systems II: Express Briefs

IEEE Transactions on Cybernetics

International Journal of Information Technology & Decision Making

Journal of Advanced Computational Intelligence and Intelligent Informatics

Journal of Advanced Transportation

Journal of Robotics

Mathematical Biosciences and Engineering

Physica A: Statistical Mechanics and its Applications

Soft Computing

Swarm and Evolutionary Computation

Transportation Research Part B: Methodological

Unmanned Systems

Zidonghua Xuebao/Acta Automatica Sinica

Reviewer for Conferences

Chinese Automation Congress (CAC)

Chinese Control and Decision Conference (CCDC)

Chinese Control Conference (CCC)

International Workshop on Advanced Computational Intelligence and Intelligent Informatics (IWACIII)

Research Experience

Principal Investigator, Research on multi-objective optimization and decision-making for high-speed railway rescheduling under uncertainty, National Natural Science Foundation of China, No. 62203468, 2023.01-2025.12.

Principal Investigator, Research on the train scheduling and decision making system under uncertainty, Foundation of China Academy of Railway Sciences Corporation Limited, No. 2019YJ071, 2019.10-2020.12.

Participant, Theory and methodology of autonomous cooperative operation control in high-speed railway, National Natural Science Foundation of China, No. U1934220, 2020.01-2023.12.

Participant, Command control and decision making in multi platform under uncertainty, National Natural Science Foundation of China, No. 61773066, 2018.01-2021.12.

Participant, Research on the dynamic fire allocation in network-centric warfare, National Natural Science Foundation of China, No. 61304215, 2014.01-2016.12.

Participant, Optimization and decision making in Networked Fire Control System Deployment under dynamic environment, National Natural Science Foundation of China, No. 61203181, 2013.01-2015.12.

Participant, Dynamic deployment optimization analysis in Networked Fire Control System, Fundamental Research Funds for Beijing Institute of Technology, No. 20120642004, 2013.01-2013.12

Teaching

Beijing Institute of Technology

Final Year Project (B.Eng.): Instructor Assistant, 2014.

Wings' Project funded by Beijing Municipal Commission of Education: Instructor, 2013-2014.

Honors and Awards

IWACIII 2021 Session Best Presentation Award, 2021

Innovation Award (second place) from the Ministry of Industry and Information Technology, 2018

Outstanding Reviewer, Applied Soft Computing (Elsevier), 2018.

JACIII Young Researcher Award, 2017.

Second Prize in National Postgraduate Mathematic Contest in Modeling, 2013.

Outstanding Postgraduate Student, 2012-2013.

Third Prize in the Programming Contest in Beijing Institute of Technology, 2012/2013.

Second Prize in National Undergraduate Electronic Design Contest, 2011.

Five-time recipient of People's Scholarship in Beijing Institute of Technology, 2008-2012.